8. The electrode of claim 1 wherein the composite particle is made up of manganese particles dispersed in a matrix of the shielding material.

Please cancel claim 2.

REMARKS

In the final office action dated December 4, 2002, claims 1-5 & 7-8 were rejected under 35 U.S.C. 102(b) as anticipated by Kulikowski et al. (U.S. Pat. No. 5,369,244). In addition claims 6 & 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kulikowksi et al

Claim Rejections- 35 USC § 102/103

The rejection of claims 1-5 & 7-8 under 35 U.S.C. 102 as being anticipated by Kulikowski et al. is respectfully traversed. The rejection of claims 6 & 9-11 under 35 U.S.C. 103 as being unpatentable over Kulikowski et al is also respectfully traversed.

In making the rejection, the examiner has stated that: "If a composition is physically the same, it must have the same properties. A chemical composition and its properties are inseparable. Therefore the prior art teaches the same chemical composition, the properties of instant claims are necessarily present." However, the chemical composition claimed as applicants' invention is **not** the same as disclosed in Kulikowski et al. The Examiner's statement is incorrect. Applicants' welding electrode contains a **manganese-containing composite particle** (discussed below), which is **not** present in Kulikowski. In an effort to more clearly define the invention, the applicants have amended claim 1 to incorporate claim 2. In doing this the composite particle is more specifically defined as a composite particle that contains a shielding material. A shielding material is defined on page 2, line 5 of the application as a material that prevents the manganese from vaporizing and oxidizing.

The objective of applicant's invention is to reduce the amount of manganese fume generated from the presence of manganese in welding wire. Applicant teaches that by encapsulating the manganese into a **composite particle** with a shielding material (e.g., as shown in Fig. 2 of application) , the amount of manganese fume generated is reduced. Another

embodiment of the **composite particle** is an agglomerate of manganese with the shielding material (shown in Fig. 3 of application). Essentially, when the electrode melts during the welding operation, the shielding material in the **composite particle** prevents the manganese from oxidizing which results in more manganese residing in the weld deposit and less manganese present in the fume, thereby reducing the amount of manganese fume generated (page 2, lines 1-6 of application). In accordance with the invention by intimately associating manganese with a shielding material in a composite particle, the manganese fume is reduced.

Applicant teaches that to prepare the **composite particles,** the blend of manganese and titanium dioxide is dry blended for approximately 10 minutes in a mixing blender. After dry blending, sodium silicate (water glass) in liquid form is added to the dry blend to bind the materials together into composite particles (lines 4-7, pg. 5 of application). The manganese is **intimately associated** with a shielding material to form **composite particles** and is **not a simple admixture**. As explained in the first full paragraph on page 4 of the application (lines 3-14), tests were performed with the same amount of manganese in the wire (2.32% of manganese by weight of the wire in each test), while adjusting the percentage of manganese-containing composite particles from 25% to 50 % to 75% composite particles in the core composition with each respective test. As shown in Figure 4 of the application, as the amount of manganese containing **composite particle** is increased (while keeping the total percentage of manganese by weight of the wire the same), the amount of manganese fume decreases up to 36%. Thus, by keeping the **amount of manganese in the wire constant**, but **incorporating more of the manganese in the wire in the form of composite particles**, the **amount of manganese fume is reduced**. Accordingly, the reduction in fume is attributed to the presence of **manganese-containing composite particles** in the core. As explained in the application, by **intimately associating the manganese in a composite particle**, the manganese is not readily oxidized upon welding, the manganese is prevented from vaporizing, and **manganese oxide vapor is reduced**. Kulikowski does **not** teach the use of this **composite particle** in **reducing any fume generation**.

The examiner states that Kulikowski et al. teaches a fill material which includes manganese (abstract & col. 2, lines 20-26) and also teaches low fume generation (col. 3, lines 28-41). The **low fume generation** taught in Kulikowski, however, is **not related to the**

manganese, but to the **presence of Teflon**. More specifically, as described in Kulikowski, the **low fume generation** relates to a **low oxygen and low hydrogen content** resulting from the **chemical reaction with Teflon**. Kulikowski teaches this process of achieving low oxygen and low hydrogen content by incorporating Teflon into the electrode. In sum, the Teflon (polytetrafluoroethylene) is disassociated to produce flourine, which then combines with hydrogen to produce hydrogen flouride, thereby reducing the amount of hydrogen fume (col. 6, lines 10-32). This process is wholly different from applicant's use of **composite particles** to reduce manganese fume. Kulikowski says **nothing about reducing manganese fume, nor does it say anything about a manganese-containing composite particle**. Furthermore, the **presence of manganese** in Kulikowski has **nothing to do with the low fume generation** taught in Kulikowski; it is the **incorporation of Teflon** which **leads to the low fume generation** as described above. In fact, the **mere presence of manganese alone** in applicant's invention **does not result in low fume generation either**; it is the incorporation of manganese into a **composite particle** which results in the **reduction of manganese fume** as explained in the previous paragraph.

In summary, because Kulikowski et al. does not teach the use of manganese-containing composite particles to reduce manganese fume nor does Kulikowski et al teach reducing manganese fume, Kulikowski et al. cannot teach or suggest the claimed invention and the rejection must fail.

In the second rejection, claims 6 & 9-11 are rejected under 35 U.S.C. 103(a) as being obvious in view of Kulikowski et al. The examiner states that the compositions closely approximate or overlap applicant's claimed composition in range. The applicant submits that these claims are patentable for the reasons already stated, namely, the manganese is closely associated with a shielding material in the form of a composite particle.

In view of the foregoing reasons, the applicant respectfully requests that the rejections under 35 U.S.C. 102/103 be withdrawn and that this case receive favorable action on the merits.

Respectfully submitted,

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MARKED UP VERSION OF AMENDED CLAIMS

1. A cored electrode for arc welding, said electrode having a core in which the fill material includes a manganese-containing composite particle wherein the composite particle contains manganese in admixture with a shielding material.

3. The electrode of claim ~~2~~1 wherein the shielding material is TiO_2.

7. The electrode of claim ~~2~~1 wherein the composite particle contains manganese encapsulated in a coating of said shielding material.

8. The electrode of claim ~~2~~1 wherein the composite particle is made up of manganese particles dispersed in a matrix of the shielding material.